Guide Infrared

IR518E Monocular Thermal Imager

User Manual

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Chapter 1 Introduction

IR518E is of ultra-compact, lightweight & unparalleled design, low power dissipation, more reliable functionality and robust performance. **IR518E** can penetrate through haze, smoke, rain, snow and total darkness to track and aim target which is difficult to be observed by human eyes in both day and night, and all weather condition. It makes the war field “single-track clarity” for us and meets various demands of high accuracy for night vision, identification, tracking, analysis, and etc, reach the international military standard.

Features:

- ✧ High resolution uncooled FPA technology
- ✧ Two version (384X288 and 160X120) are available, two lens options (25mm and 50mm) are available.
- ✧ 640X480 LCD screen
- ✧ Color Palettes are available
- ✧ Auto tracking for the high temperature spot
- ✧ Able to freeze and save the picture of infrared image.
- ✧ Able to record the video of infrared image.
- ✧ The saved infrared image and video can be transmitted to the PC via the USB port.
- ✧ Adopt the interpolation zoom method to perform the electronic magnification, and there are no mosaic appeared. It takes good effect on distant observation.
- ✧ Auto/Semi-auto brightness and contrast.
- ✧ Small size, light weight, and easy operation
- ✧ 50Hz frame rate
- ✧ License free

Chapter 2 Precautions and maintenance

- ✧ Do not direct the **IR518E** Thermal Imager at very high intensity radiation sources such as the sun, carbon dioxide lasers or arc welders etc.
- ✧ Do not direct the **IR518E** Thermal Imager at high temperature target when power-on the **IR518E** Thermal Imager.
- ✧ When the **IR518E** Thermal Imager is not in use or is to be transported, ensure that the battery is taken out and the unit is stored in the protective carry case.
- ✧ The **IR518E**Thermal Imager integrates precision optical equipment and static-sensitive electronics, so please do not casually place, knock, or shock the thermal imager and accessories, and make it far off the static to avoid any damages.
- ✧ Never attempt to disassemble or open the imager body, as this action will void the warranty. Contact manufacturer for calibration or repair.

To ensure that the **IR518E** Thermal Imager is kept in a good working condition and remains fully functional operation, the following guidelines should be respected at all times:

- All User Manuals and leaflets should be read thoroughly before proceeding with operation of the equipment, please contact us if there is any unclear.
- Keep the **IR518E** Thermal Imager steady during operation.
- Do not use the **IR518E** Thermal Imager beyond the specified operation condition scope.
- Do not apply the non-fitted thermal imager adapter.
- Do not frequently power on/off the imager. The time between on and off should be not less than 20 sec.
- Do not pull in/out all the cables when the imager is power-on; and highly recommend to cut off the power of all the connected electric systems when pull in/out the cables.

- If the observation is over or in holding state, please timely cut off the power so as to effectively extend the imager lifetime.
- Pay attention to the protection of the various cables and wires that connected with thermal imager.
- Do not clean with chemical solvent, diluents. The clean, soft and dry flannelette is available.

As the thermal imager lens had been coated an antireflective film layer and often clean will damage the coating, the optical surfaces of the imager lens should only be cleaned when visibly dirty. Please avoid touching the exposed lens surface, as the acid substance on the print will damage the coatings and lens substrates. Use only a proprietary lens cleaning tissue.

Chapter 3 IR518E Technical Specifications

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Detector	
Detector Type：	Uncooled FPA microbolometer
Spectral range：	8～14μm
Pixel：	384×288、160X120
Pitch：	25μm×25μm
NETD	Less than 110mk
Image Performance	
Lens：	50mm/25mm
FOV：	10.97°×8.24° (50mm) , 9.15°x6.87° (25mm)
Focal length：	50mm/25mm
Focus range：	5m～∞
Image presentation	
Video output：	PAL
Electronic Zoom：	2X
Frame Rate	50Hz
Adjust	Auto/Semi-auto brightness and contrast adjustment
Polarity	Black/White hot
Display：	640X480 LCD viewfinder
	Pixel 320X240
	Displaying area 12.78×9mm2
	256 level gray
Power System	
AC/DC adapter：	110-240VAC→9VDC
Rechargeable Ni-MH battery：	1.2V/2500mAh X4
Power dissipation：	＜5W@25℃
Operation time：	＞2 hours@25℃
Environmental Parameters	
Operating Temperature:：	-40℃～+60℃(not include batteries)
Storage Temperature：	-45℃～+65℃(not include batteries)
Vibration	Sine wave 5Hz～200Hz～5Hz accelerated speed: 2.0g duration 6min X axial vibration
Shock:	Half-sine wave accelerated speed: 25g duration 6ms X axial shock 3times
Interface	

Interfaces:	Analog video output / USB port/ RS232
Physical Characteristics	
Colour：	Black
Weight：	760g (with batteries and SD card)
Size:	182mmx97mmx68mm

Chapter 4 Buttons and interface of imager

IR518E Thermal Imager figure

The function keyboard is on the top of IR518E

Buttons Instruction

Buttons		Function
	POWER	Press 3 sec to power on/off the imager
		Short press to calibrate the imager manually.
	M	When no menu displayed：Press 3 sec to bring out menu. Short press to switch between white/black hot.
		When menu displayed：Press this button to select the menu items
	+	When menu displayed： Press this button to choose the menu from left to right.
		When no menu displayed：Switch between original image and 2X image
	−	When menu displayed： Press this button to choose the menu from right to left.
		When no menu displayed：Short press to take and save infrared image. Long press to take and save image video

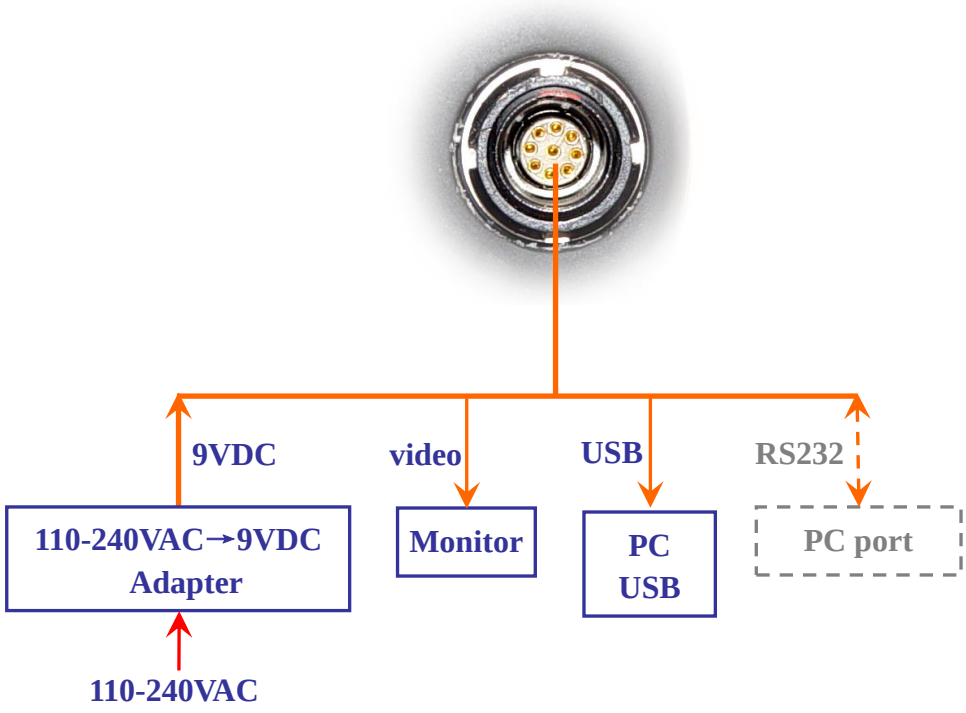
IR518E imager can be used as handheld device or can be stably installed on tripod ， please see the screw hold on the bottom side of the camera .

Chapter 5 Quick start guide

5.1. Preparation

1) The operator could hand hold the IR518E Thermal Imager, or fix it on the tripod.

2) According to the thermal imager interface definition, connect the enclosed video/USB cable, power cable and 9V power adapter to the display equipment and AC power shown as below picture. When Insert the cable plug into the thermal camera socket, please aim the convex part to the concave part and slightly insert.



Note: When the camera connected with the PC by USB port, all button operation will be ineffective. Thus, please do not connect the camera with the PC when observing, and only connecting when transmitting the picture or video. The RS232 communication function is reserved.

3) Please use the 1.2VNi-MH batteries (4 of them) to power on the imager. Insert them into the imager as the following picture

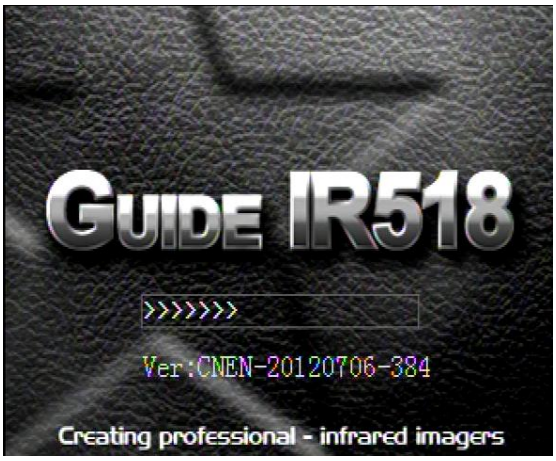
4) SD card is inserted into the imager as the following picture.

5) Close the battery cover，make sure the battery and SD card are accurately inserted.

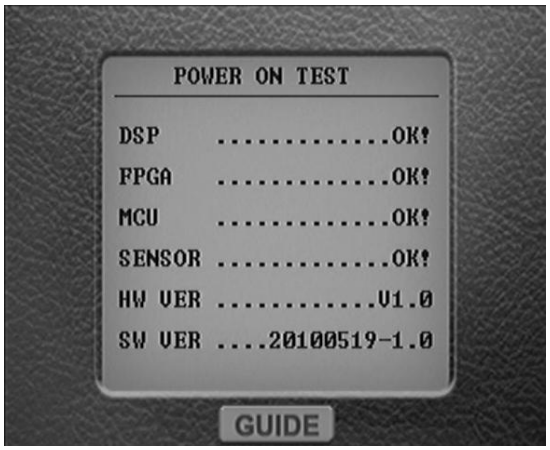
5.2 Quick start guide

1) After careful checking，press power button for 3 sec to power on the imager.

2) Starting-up image is as following picture:



3) Self-checking process is shown on the screen.



4) Manually screw the lens until you see the clear image on the screen.

5) The imager has IR sensor right beside the eye-piece, when your eye is near, the screen is working, when your eye leaves for a certain time (stand by time is adjustable in the menu), the camera is under stand-by mode.

6) The Thermal Imager will do non-uniformity-calibration automatically.

7) Short press power button to calibrate the imager if there is any non-uniformity occurs during the operation.

8) Aim the thermal imager to the target and observe.

9) Imaging:

   a) Rotate the lens until the target can be clearly observed.

b) Aim the Thermal Imager to the target.

C) The default mode is AUTOMATIC MODE which provides user with a clear image after simply focusing. User can also adjust the brightness and contrast to get a qualified satisfying image.

. Adjust the focus manually to get clear image.

Note: When human eye left the eye detector, the imager will enter stand-by mode, when eyes get close to the eye detector, the LCD will lighten again!

The stand by time can be adjustable in the menu as 4 minutes, 10 minutes , 15minutes and 20 minutes.

10) Function Brief: Detailed button operation instructions such as Brightness and Contrast adjustment, Polarity selection, cursor choosing and checking, setting language and button instruction, parameters save, freeze, save and playback pictures, record and playback infrared video, focus adjustment, non-uniformity calibration and etc functions, please refer to OPERATION INSTRUCTIONS in the next section.

11) Power-off: When operation completed, firstly put back the lens cover, then press and hold the power button till the shut-down progress bar on the screen reach its right end. After that, remove the cables from the sight by holding the lock pin on the cable and pulling it out. Do not pull the cable by force, otherwise damage may occur!

Chapter 6 System operation

6.1 Power Instructions icon

When the thermal imager works with the external power supply, a plug mark will present on the right corner of the screen as the below image shown.

When the thermal imager works with the enclosed Li-ion battery, a battery mark will present in the right corner of the screen as the below image shown.

The system continuously monitors the power supply voltage. If the power is not enough, there will be a window jump out to warn the user, if user does not take any measures for it, the system will automatically shut down after a certain power decrease.

6.2 Menu Instruction

After start-up, press the “M” button, and the menu bar will be presented on the screen as the below image shown. The button instruction will be displayed to state the buttons function on the screen, and user can operate as the button instruction.

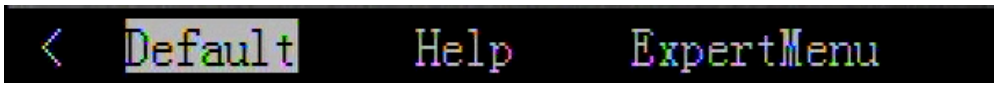
Menu as follows will display on the screen.

Menu 1：

Menu 2：

Menu 3：

Menu 4：



Press “+” or “-” buttons to adjust the parameters of selected item, press “M” to confirm the select and enter to sub-menu.

6.3 Help menu

Choose “Help” then press “M” to enter to Help Menu. Press “＋”、“－” to view the helping information. Press “M” again to exit this menu.

6.4 Button instruction setting

Select “Note.” then press “M” to choose whether the button instruction shall be displayed or not.

We suggest users to open the button instruction.

6.5 Stand-by mode

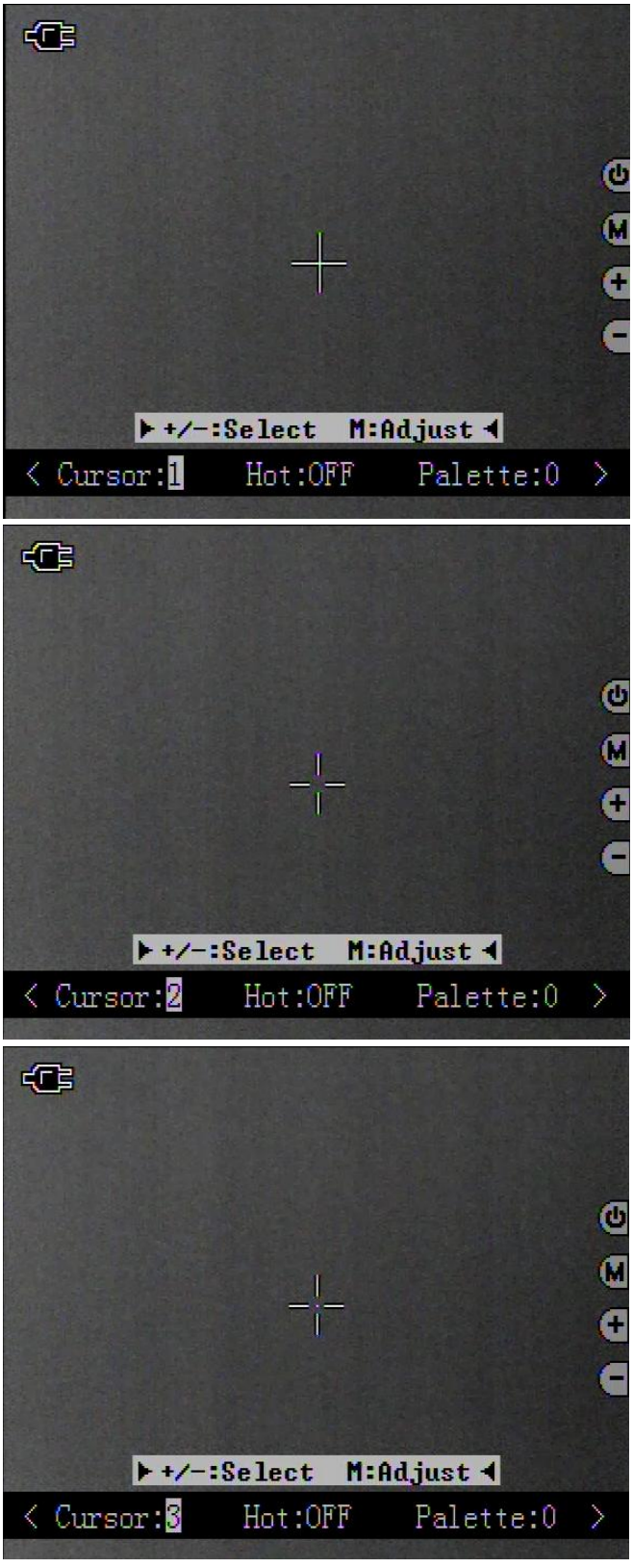
You can press button “M” to enable/disable of the standby mode. To set “Standby as 4/10/15/20min” to enable the feature.

If under the stand-by mode, when the IR sensor besides the eye-piece detect the human eye, the LCD screen will be working, when your eye leaves the eye-piece, after 2 min the screen will shut down and the camera will be power off after 4 min, 10 min, 15min or 20 min.

If the stand by mode is off, no matter the eye is close or not, the LCD screen will always be light.

6.6 Crossed hair cursor

User can choose the crossed hair cursor . Choose “Cursor” then press “M” to switch the cursor setting .When it’s set as 0, there will be no cursor. When set as 1 to 3, you will see the following image.


+/-:Select M:Adjust
Cursor:1 Hot:OFF Palette:0
+/-:Select M:Adjust
Cursor:2 Hot:OFF Palette:0
+/-:Select M:Adjust
Cursor:3 Hot:OFF Palette:0

6.7 Image adjustment

6.7.1 Auto/Semi-auto mode setting

Choose “Auto/SemiAuto” then press “M” to switch between Auto and Semi-auto mode, and correspondingly to select the brightness, contrast Auto/SemiAuto adjustment ways.

Mode	Menu content	Effect
Auto	Brightness, Contrast	Auto offset and gain
Semi-auto	Brightness, Contrast	Auto offset, manual gain

In the above table, brightness is the expect value of the average of the actual value of the whole or part of the image; contrast is the expect value of the actual contrast of the whole or part of the image; offset and gain are two parameters related to brightness and contrast in the brightness and contrast calculation

6.7.2 Brightness and contrast adjustment

In the automatic mode, user can adjust menu item “B” to get satisfying image brightness, and adjust menu item “C” to get satisfying image contrast. System sets offset and gain in real time as per your input to obtain acceptable image quality. Parameters of menu item “B” and “C” values are shown in percentage.

In the semiautomatic condition, user can adjust menu item “B” to get satisfying image Brightness. System automatically sets offset as per your input brightness value. User can adjust gain manually. Parameters of menu item “B” and “C” values are shown in percentage.

Notice:

If user find the contrast is low when using the imager just like below.

User can adjust contrast according to the circumstance condition in order to make a satisfying image.

6.7.3 Electronic Zoom

The thermal imager can also conduct electronic zoom function. When no menu displays, press the "＋" to switch the original image and 2 times zooming image.

Original image (Z: 1)

2 times zooming image (Z:2)

6.7.4 Polarity

IR518E uses different gray level to indicate different temperature. Under positive polarity mode, brighter part represents higher temperature. While under negative polarity mode, brighter part represents lower temperature. When no menu displays, short press “M” to switch between 2 polarity modes .

White Hot

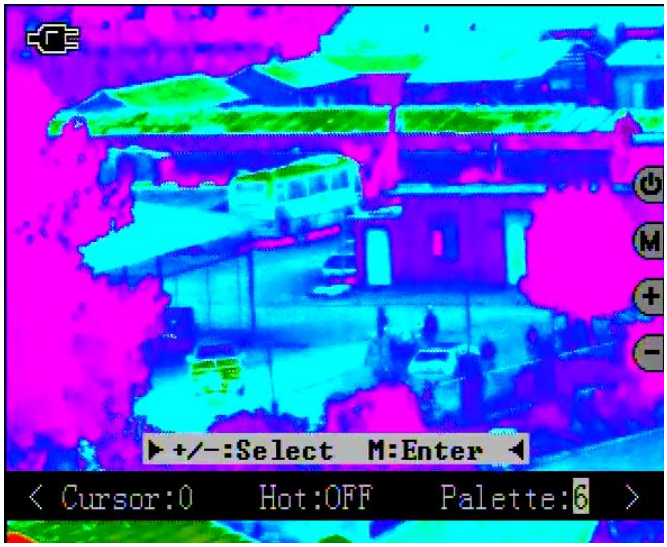
Black Hot

6.7.5 Colour palettes

Choose “Palette” then press “M”to choose from 0～8 号, and you will find 9 different showing accordingly.

Palette 0

Palette 4



Palette 6

6.8 Hot spot tracking

Choose“Hot”then press“M”, set “Hot：ON”, the highest temp spot will be shown on the screen

6.9 Freeze and save the infrared image and video

6.9.1 Freeze and save the infrared image

Before taking photo, firstly aim to the target and adjust the focus, then keep the thermal imager body stable, so as to obtain a clear image, when no menu displays, press “-” to freeze infrared image and save it into the built-in SD card, there is indication of the file name on the upper left side of the screen. After saving, the thermal imager will return to the real time infrared image status.

6.9.2 Take and save the infrared video

When no menu displays, long press “-” to take infrared video, and save it in the built-in SD card.IR518E shows the recording time that left according to the memory space.

In the above picture, the file name, recording time and left recording time are displayed. Long press “-” to stop the video taking.

6.10 Infrared image and video playback

Choose “Replay” then press “M” to enter the below interface.

User operate according to the indication, press “+” to enter the interface shown below.

According to the indications, press “+”、“-” to browse infrared images, press “M” to enter the interface that shown below.

Three operations can be done according to the indications shown in the above picture:

1) Press “M” to exit playback menu and back to live infrared image.
2) Press “+” to return image playback menu.
3) Press “-” to enter “image delete” menu.

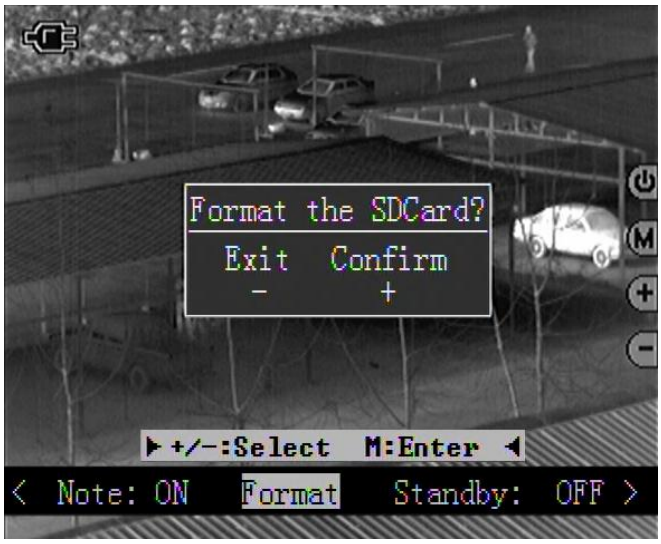
Three operations can be done according to indications shown above.

1) Press “M” to return image playback menu.
2) Press “-” to delete one infrared image and then return back to image playback menu.
3) Press “+”, you will see the picture shown as below.

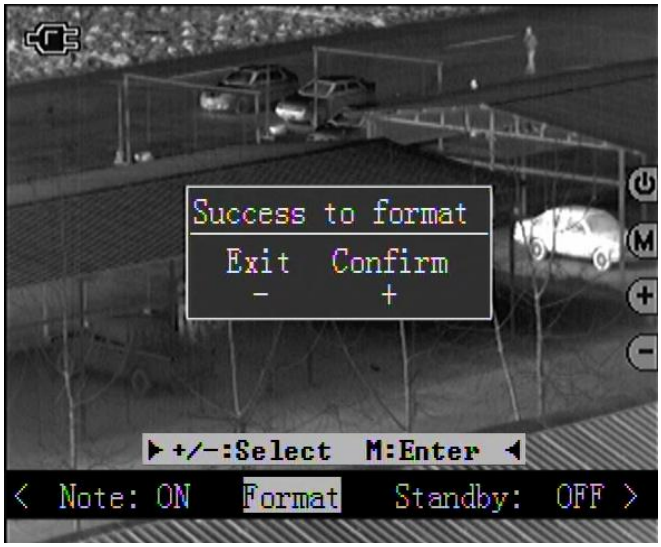
According to the indication, press “-” to confirm the delete of all infrared images, then return back to playback menu; Press “M” to cancel the delete operation ,then return to image delete menu. The operation of video playback is the same as images.

6.11 Formatting SD card

Infrared images and videos can be stored in the built-in SD card. Choose Format” menu, then press “M” to format the SD card.



According to the indications shown in the picture, press“-”to exit the operation；Press“+”to format SD card, see below picture



6.12 Restore factory setting

Choose “Default” then press “M”, the below picture will shown on the screen

According to the indications, press “-” to cancel the operation; Press “+” to restore factory setting.

6.13 Transmit the image and video from the thermal imager to PC

The method of transmitting the image and video from the thermal imager to PC is the same as the digital camera picture transmitting.

Connect the thermal imager and PC via the USB cable; the PC can identify the removable storage device. Double-click the “GUIDE_IR” disc mark to open the storage device; there are two folders in the storage device, “PICTURE” and “VIDEO”, and these two folders are respectively stored infrared pictures and videos. User can conduct copy, cut, and delete and etc operations as the normal files. After operation, please eject the removable storage device “GUIDE_IR” and then pull out the USB cable plug.

Chapter 7 Battery Status

IR518E thermal imager is power supplied by 4 units of replaceable and rechargeable Ni-MH AA batteries, average operation time is 2 hours.

The battery should be charged with a battery charger.

7.1 Precautions.

1) Please ensure batteries are fully charged and discharged at the first 3 times
2) Please choose qualified rechargeable batteries. The min current should be 2500mAh.
3) The battery charger will **not** be supplied in standard package and it could be purchased locally.
4) Please charge batteries when the ambient temperature is between 0℃ to 40℃
5) Do not mix new batteries and old batteries together to operate the camera
6) Do not mix batteries of different types together to operate the camera.

Chapter 8 Trouble Shooting

If the **IR518E** meets troubles please check the items listed below first, if the troubles beyond those ones please contact us as soon as possible.

No.	Trouble	Reason/Measure
1	The Thermal Imager can not be turned on, or there	No battery or lack of power; remove battery and install a fully charged one

	is blue screen.	·Battery bad connection; reinstall the battery and tighten the battery cover. ·Switch off the system, and reboot it after 20 seconds.
2	The image is blurry	• Adjust focus till image clear.
3	The image is too dark or too bright	• Perform NUC function manually. · Adjust brightness and contrast manually or set to auto brightness/contrast mode.
4	No image output	• Display equipment connection problem or video cable connection problems

IR518E Standard Packing List

NAME	QTY
IR518E Thermal Imager	1 unit
Power/video/USB/RS232 cable	1
AC adapter（Input：110-240VAC Output：9VDC）	1
4G SD card	1
NiMH batteries AA/Mignon 2700mAh	4 pcs (1 set)
Certificates	1
Hand strap	1
Shoulder strap	1
Soft bag	1
Equipment case	1